

## LISTING OF CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

- 1 1. (Cancelled) A magnetoresistive sensor comprising:  
2 first and second magnetically free layers;  
3 a magnetically pinned layer structure comprising CoFeV with an atomic percent  
4 of Fe ranging from 20-60 atomic percent and an atomic percent of V  
5 ranging from 2-10 atomic percent sandwiched between the first and  
6 second free layers, said magnetically pinned layer being self pinned;  
7 a first electrically insulating barrier layer sandwiched between said first  
8 magnetically free layer and said pinned layer; and  
9 a second electrically insulating barrier layer sandwiched between said second free  
10 layer and said pinned layer.
- 1 2. (Withdrawn) A magnetoresistive sensor as in claim 1 wherein said pinned layer  
2 is pinned by a combination of magnetostriction of the pinned layer and compressive  
3 stress within the sensor.
- 1 3. (Currently amended) A magnetoresistive sensor as in claim ~~11~~ 47 wherein said  
2 pinned layer comprises Co and Fe, wherein the atomic percent of Fe is about 50%.
- 1 4. (currently amended) A magnetoresistive sensor as in claim ~~11~~ 47 wherein said  
2 pinned layer comprises CoFe with an atomic percent of Fe ranging from 20 to 60 percent.

1 5. (currently amended) A magnetoresistive sensor as in claim 11 ~~47~~ wherein said  
2 pinned layer comprises CoFeV, with an atomic percent of Fe ranging from 20 to 60  
3 percent and an atomic percent of V ranging from 2 to 10 percent.

1 6. (Withdrawn) A magnetoresistive sensor as in claim 1 wherein said pinned layer  
2 comprises a single ferromagnetic layer comprising Co and Fe.

1 7. (Withdrawn) A magnetoresistive sensor as in claim 1 wherein said pinned layer  
2 comprises a single ferromagnetic layer comprising Co, Fe and V.

1 8. (Cancelled)

1 9. (currently amended) A magnetoresistive sensor as in claim 11 ~~47~~, wherein said  
2 ~~three~~ ferromagnetic layers of said pinned layer comprise Co and Fe and wherein the  
3 atomic percent of Fe in each layer is 20 to 60 percent.

1 10. (currently amended) A magnetoresistive sensor as in claim 11 ~~47~~, wherein said  
2 ~~three~~ ferromagnetic layers of said pinned layer comprise Co, Fe and V and wherein the  
3 percentage of Fe in each layer ranges from 20 to 60 percent and wherein the atomic  
4 percentage of V ranges from 2 to 10 percent.

1 11. (currently amended) A magnetoresistive sensor comprising:  
2 first and second magnetically free layers;  
3 a magnetically pinned layer sandwiched between the first and second free layers,  
4 said magnetically pinned layer being self pinned;  
5 a first electrically insulating barrier layer sandwiched between said first  
6 magnetically free layer and said pinned layer; and  
7 a second electrically insulating barrier layer sandwiched between said second free  
8 layer and said pinned layer;  
9 wherein said pinned layer comprises first two outer ferromagnetic layers and one  
10 inner ferromagnetic layer ~~layers~~, the outer and inner ferromagnetic layers  
11 comprising Co and Fe, said outer ferromagnetic layers having a thickness  
12 of about 5 angstroms and said inner ferromagnetic layer having a  
13 thickness of about 10 angstroms.

1 12. (Withdrawn) A magnetoresistive sensor as in claim 1, wherein said pinned layer  
2 comprises a single layer of ferromagnetic material comprising Co and Fe and  
3 wherein said single ferromagnetic layer has a thickness of 5 to 15 angstroms.

1 13. (currently amended) A magnetoresistive sensor as in claim 11 ~~47~~, wherein said  
2 barrier layers comprise Aluminum Oxide.

1 14. (currently amended) A magnetoresistive sensor as in claim 11 ~~47~~, wherein said  
2 barrier layers comprise magnesium oxide.

1 15. (currently amended) A magnetoresistive sensor as in claim 11 47, wherein at  
2 least one of said free layers comprises CoFe.

1 16. (currently amended) A magnetoresistive sensor as in claim 11 47, wherein at  
2 least one of said free layers comprises a layer of CoFe and a layer of NiFe, the  
3 CoFe layer being disposed closer to the pinned layer than the NiFe layer.

1 17. (currently amended) A magnetoresistive sensor as in claim 11 comprising:  
2 ~~first and second magnetically free layers;~~  
3 ~~a magnetically pinned sandwiched between the first and second free layers, said~~  
4 ~~magnetically pinned layer being self pinned;~~  
5 ~~a first electrically insulating barrier layer sandwiched between said first~~  
6 ~~magnetically free layer and said pinned layer; and~~  
7 ~~a second electrically insulating barrier layer sandwiched between said second free~~  
8 ~~layer and said pinned layer;~~  
9 wherein said ~~three~~ ferromagnetic layers of said pinned layer are separated from  
10 one another by first and second non-magnetic coupling layers.

1 18. (previously presented) A magnetoresistive sensor as in claim 11 comprising:  
2 ~~first and second magnetically free layers;~~  
3 ~~a magnetically pinned sandwiched between the first and second free layers, said~~  
4 ~~magnetically pinned layer being self pinned;~~

5       ~~a first electrically insulating barrier layer sandwiched between said first~~  
6       ~~magnetically free layer and said pinned layer; and~~  
7       ~~a second electrically insulating barrier layer sandwiched between said second free~~  
8       ~~layer and said pinned layer;~~  
9       wherein said ~~three~~ ferromagnetic layers of said pinned layer layers are separated from  
10       one another by first and second non-magnetic coupling layers comprising Ru.

19.   (Withdrawn) A magnetic data storage system, comprising:

a motor;

a magnetic disk rotatably connected with said motor;

a suspension;

a slider connected with said suspension for movement adjacent to said disk;

a magnetoresistive sensor, connected with said suspension, said

magnetoresistive sensor further comprising:

first and second magnetically free layers;

a magnetically pinned layer sandwiched between the first and second

free layers, said magnetically pinned layer being self pinned;

a first electrically insulating barrier layer sandwiched between said first

magnetically free layer and said pinned layer; and

a second electrically insulating barrier layer sandwiched between said

second free layer and said pinned layer.